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Forward to:

Risky Relapse into Reprocessing:

Environmental and Non-Proliferation Consequences of the Department of Energy's Spent Fuel Management Program

Foreword by Dr. Arjun Makhijani

For almost two decades, beginning with a far-sighted Ford administration decision, the United States has been alone among the major nuclear powers in recognizing that recovering plutonium from civilian power plant spent fuel does not make economic sense and, moreover, that it presents grave proliferation dangers (plutonium from civilian reactors can be used to make nuclear weapons). In 1982, the United States codified into law a prohibition against the use of plutonium of civilian reactor origin for military purposes. In 1988, the United States stopped producing plutonium in military nuclear reactors, and all plans for plutonium separation for military purposes were formally stopped in 1992. The military aspect of U.S. policy was driven by the official recognition that the United States was "awash in plutonium" (in the words of then Energy Secretary John S. Herrington) and by concerns about the safety of deteriorating production facilities.

These plutonium policies make the United States the only leading nuclear power that has actually renounced plutonium separation for either civilian or military purposes. As a result, the United States is in a unique position of leadership to address the dangers arising from continued reprocessing and accumulation of weapons-usable fissile material, whether they are of civilian or military provenance. Other declared nuclear weapons powers continue to separate plutonium for civilian or military purposes or both. Moreover, a number of countries that are not declared nuclear weapons states are accumulating separated civilian plutonium: Japan, Germany, Belgium, the Netherlands, Italy, Switzerland, and India are among them. Israel presumably continues to accumulate military plutonium. Several other countries are expressing interest in either acquiring civilian plutonium stocks by purchasing reprocessing services or in building reprocessing plants themselves.

A policy on such a crucial issue should not be put at risk without careful consideration for all the non-proliferation and other issues involved. Moreover, as many studies, including those done by the Institute for Energy and Environmental Research have stressed, most reprocessing technologies, including all operating plants, pose special environmental dangers arising from the

production of low-level, transuranic, and especially liquid high-level radioactive wastes. Every increase in the already large and problematic inventory of high-level wastes, which is stored in tanks at DOE facilities, results in some increase in the risk of fires and explosions. This is, in many ways, already the most serious safety problem in the nuclear weapons complex.

Over the past few years, and especially during 1995, portions of the Department of Energy and some of its contractors have advocated various forms of reprocessing as the solution to the *environmental* problem of managing irradiated fuel and target rods in the nuclear weapons complex. Such pressures could result in a drift back to reprocessing in the United States that would not be classified as either military or civilian in purpose, but that would nonetheless pose similar proliferation and environmental dangers. Thus, instead of moving to the next logical step in its non-proliferation policy, that of permanently shutting down all reprocessing plants and decommissioning them, the United States appears to be moving in the opposite direction. This dangerous drift is occurring without adequate national debate about its proliferation, environmental, and economic consequences.

DOE and its contractors seem to be like the proverbial carpenter with only a hammer for a tool -- in this case the hammer is reprocessing. When DOE first proposed reprocessing as a technology for environmental management (in the late 1980s), IEER did a major study of the documents justifying the decision in collaboration with the Hanford Education Action League. In that case, Westinghouse and DOE proposed to reprocess spent fuel from the N-reactor at Hanford, which was then (and is still) stored underwater in pools called the K-basins. Our work showed that Westinghouse and DOE had rushed to the unwarranted conclusion that reprocessing was the most environmentally appropriate technology to address the problem of managing this spent fuel. We further concluded that dry storage of the spent fuel was more environmentally sound and probably less expensive. That was in 1990. Since that time DOE has agreed that dry storage is in fact the more appropriate choice for Hanford spent fuel. But now, proposals for reprocessing other spent fuel are mushrooming, as spending on weapons declines.

At the end of the Cold War, the problem of vast stocks of weapons-usable material and of potential black markets in them are among the most serious and urgent proliferation threats. These issues were highlighted (once again) in August in hearings held by the European Subcommittee of the Senate Committee on Foreign Relations, chaired by Senator Richard Lugar. The United States simply cannot afford to abandon its leadership role on reprocessing for the sake of a hasty approach to managing spent fuel, an approach that has the decided odor of pork-barrel spending for nuclear contractors. The next few years will be critical in determining the long-term future production and distribution of separated weapons-usable fissile materials, and decisions related to this issue need to be more carefully considered.

In order to assess the technical and policy soundness of recent claims that reprocessing ought be pursued as an environmental management technology, IEER undertook a review of all four DOE Environmental Impact Statements relevant to this subject. The review was carried out by Noah Sachs, the outreach coordinator of the plutonium project and the author of this report. The report grew out of a trip Noah and I made to Idaho in June 1995 to discuss DOE's proposal to ship spent fuel to the Idaho National Engineering Laboratory (INEL). Local groups were concerned that DOE's plan to regionalize spent fuel in a few locations in the United States may be a spur to

reprocessing the spent fuel. It became clear that DOE may be drifting into a reversal of U.S. progress on reprocessing under pressure from its own sites.

IEER and the author are responsible for the contents of the report. I conducted a close review of the report and helped shape its recommendations in close collaboration with the author.

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Arjun Makhijani
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